HEX Display

003

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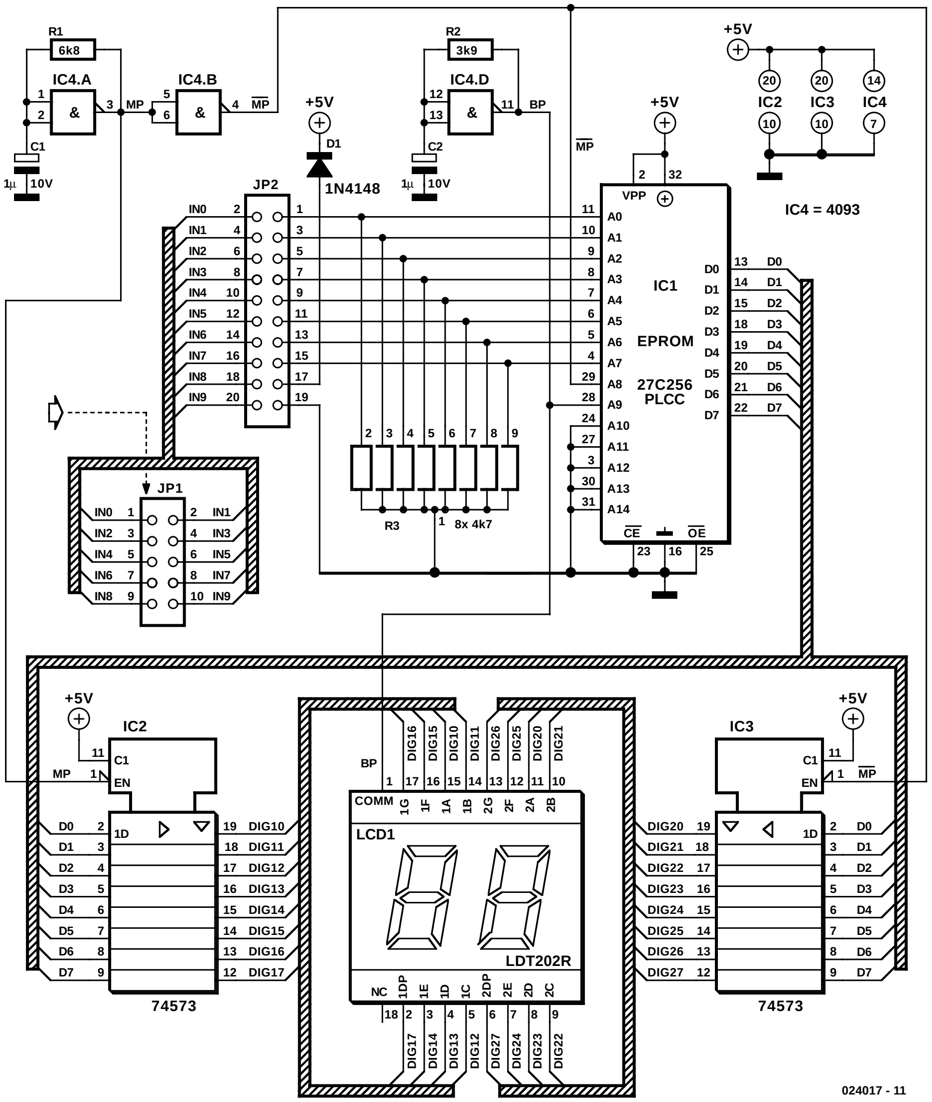

When experimenting with digital and microcontroller-based circuits it is often more convenient to display a value as a number and not as a bit pattern on a row of LEDs. This circuit is designed for exactly that purpose. Thanks to its low current consumption (a little under 10 mA) and its compact construction it can be plugged directly into a header on a microcontroller board, taking its supply from that board. An EPROM, which stores all the required values for display, is used as the decoder. The 256 kbit EPROM is considerably larger than strictly necessary for this job — 1 kbit would be enough — but the type shown is much easier to obtain.

The binary data (and power, if available) are taken from JP1 to one side of JP2. The binary data and power signals can be permuted using a suitably-wired plug fitted into JP2. Also, power can be provided at this point, if it is not available from JP1. The data are now taken directly to address signals A0 to A7. The incoming data byte is viewed as two 4-bit values. The clock generator consisting of IC4.A and IC4.B switches between banks in the memory using address line A8. At the same time this signal provides a multiplex clock for IC2 and IC3. At any given moment the outputs of exactly one of these latches are enabled while those of the other are put into a high-impedance state. In this way the high and low halves of the input byte are separated and switched through to the correct digit.

Oscillator IC4.D produces the backplane signal for the LCD. An LCD segment only 'lights' when its front and rear electrodes are driven with signals of opposite phase. The backplane signal is therefore also taken to A9 on the EPROM as a further bank-switching signal (we can afford to be generous with memory space!). This memory bank stores mask values for each possible input value.

The author has designed a printed circuit board for this circuit. The layout, in Eagle format, is available for download from the *Elektor Electronics* website, along with the HEX file for the EPROM. The file numbers are **024017-1** and **024017-11** respectively.

(024017-1)